1602 A instructions

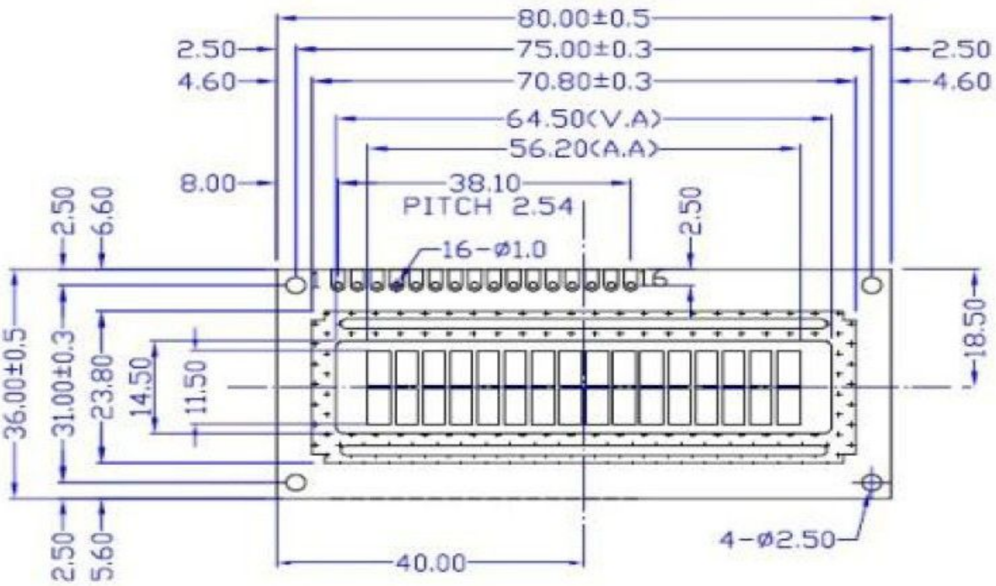
LCD USES manual

Directory

Summarize

（1602A QAPASS ）is an industrial character type LCD, can also shows that 16 x02 namely 32 characters. (16 column 2 line)

Second:module size (pictured)



Three:pin interface specifications table

Numbers symbols pin pin that Numbers symbols that

Numbers	symbols	Pin that	Numbers	symbols	Pin that
1	VSS	To power	9	D2	data
2	VDD	power positive	10	D3	data
3	VL	Liquid crystal display bias	11	D4	data
4	RS	Data/command options	12	D5	data
5	R/W	Read/write choice	13	D6	data
6	E	By using the signal	14	D7	data
7	D0	data	15	BLA	Backlighting power positive
8	D1	data	16	BLK	Backlighting power negative

1 foot: for to power VSS.

2 feet: VDD take 5 V is power.

3 feet: VL for LCD contrast the adjustment, and then when the power is the weakest contrast, grounded contrast the highest, and the contrast

Through high can produce the "ghost", when used, can pass a 10 K adjust potentiometer contrast.

4 feet: RS for registers choice, high electric usually choose data registers, low electric usually choose instruction register.

5 feet: R/W signal lines for reading and writing, high electric usually are read operation, low electricity at ordinary times for write operation. When the RS and the R/W common

For low electricity can be written instructions at ordinary times, or displays address, when RS for low level R/W high power for at ordinary times can read busy signal, and when

RS for high level R/W for low electricity data can be written at ordinary times.

6 feet: E end to make can end, when E is driven by high level jump into low electricity at ordinary times, LCD module executive order.

7 to 14 feet: D0 ~ D7 for eight two-way data cables.

15 feet: back light positive.

16 feet: back light negative.

4. 1602 LCD instructions in time sequence that

1602 LCD module internal controller of article 11 control instruction, as the chart shows:

Numbers	instructions	RS	R/W	D7	D6	D5	D4	D3	D2	D1	D0
1	Clear display	0	0	0	0	0	0	0	0	0	1
2	Cursor to return to	0	0	0	0	0	0	0	0	1	*
3	Buy input mode	0	0	0	0	0	0	0	1	I/D	S
4	Display the on/off control	0	0	0	0	0	0	1	D	C	B
5	The cursor or character shift	0	0	0	0	0	1	S/C	R/L	*	*
6	Buy function	0	0	0	0	1	DL	N	F	*	*
7	Buy character CunZhuQi address happens	0	0	0	1	Characters CunZhuQi address happens					
8	Buy data CunZhuQi	0	0	1	Display the data CunZhuQi address						
9	Read busy symbols or address	0	1	BF	Counter address						
10	Write count to CFRAM or DDRAM	1	0	To write data content							
11	From CFRAM or DDRAM readings	1	1	Read data content							

14: control command table

1602 LCD module of reading and writing, and the screen and light mark operation operations are through the instructions of programming realize. (note: 1 for high Level, 0 for low level)

Instruction 1: clear display, instruction code 01 H, the cursor is reset to address 00 H position.

Instruction 2: the cursor reset, the cursor to return to address 00 H.

Instruction 3: the cursor and display mode I/D: cursor movement direction, high level move to the right, low level moves left S: all on the screen

Is the text moves left or move to the right. High level said effective, low level is invalid.

Instruction 4: display switch control. D: control overall display of open and shut, high level says open display, low level said shut show

And C: the open and close to control a cursor, high level said the cursor, low level said no cursor B: whether to control a cursor flashing,

High level flashing, low level do not twinkle.

Command 5: the cursor or display shift S/C: high electricity at ordinary times of mobile displays text, low electric usually move the cursor.

Command 6: function setting command DL: high electricity at ordinary times for four bus, low electricity at ordinary times for eight bus N: low electricity at ordinary times for single line

Display, high electric usually pair on display F: low electricity at ordinary times display 5 x7 of dot matrix characters, high electric usually display 5 x10 of dot matrix characters.

Command 7: character generator RAM address Settings.

Instructions 8: DDRAM address Settings.

Instructions 9: read the busy signal and the cursor address BF: a sign for busy, high level said busy, this time the module can't receive commands or

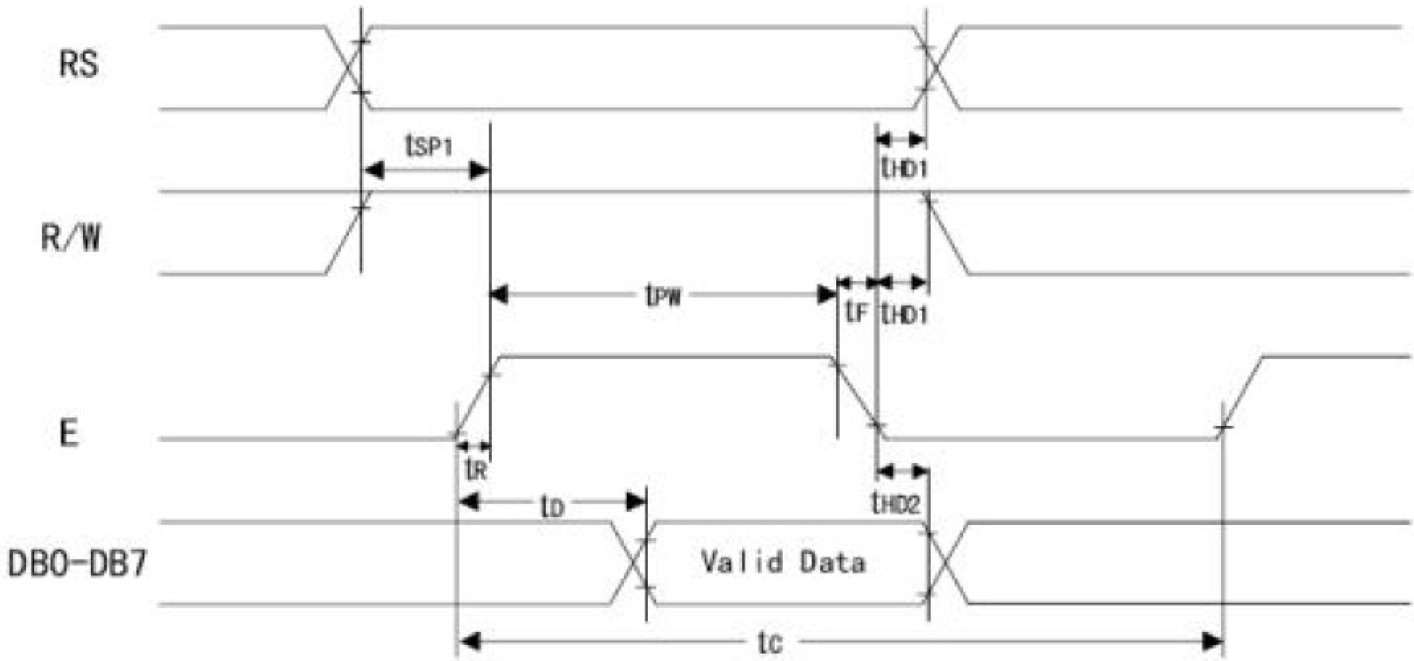
The data, if for low level is not busy said.

Directive 10: write data.

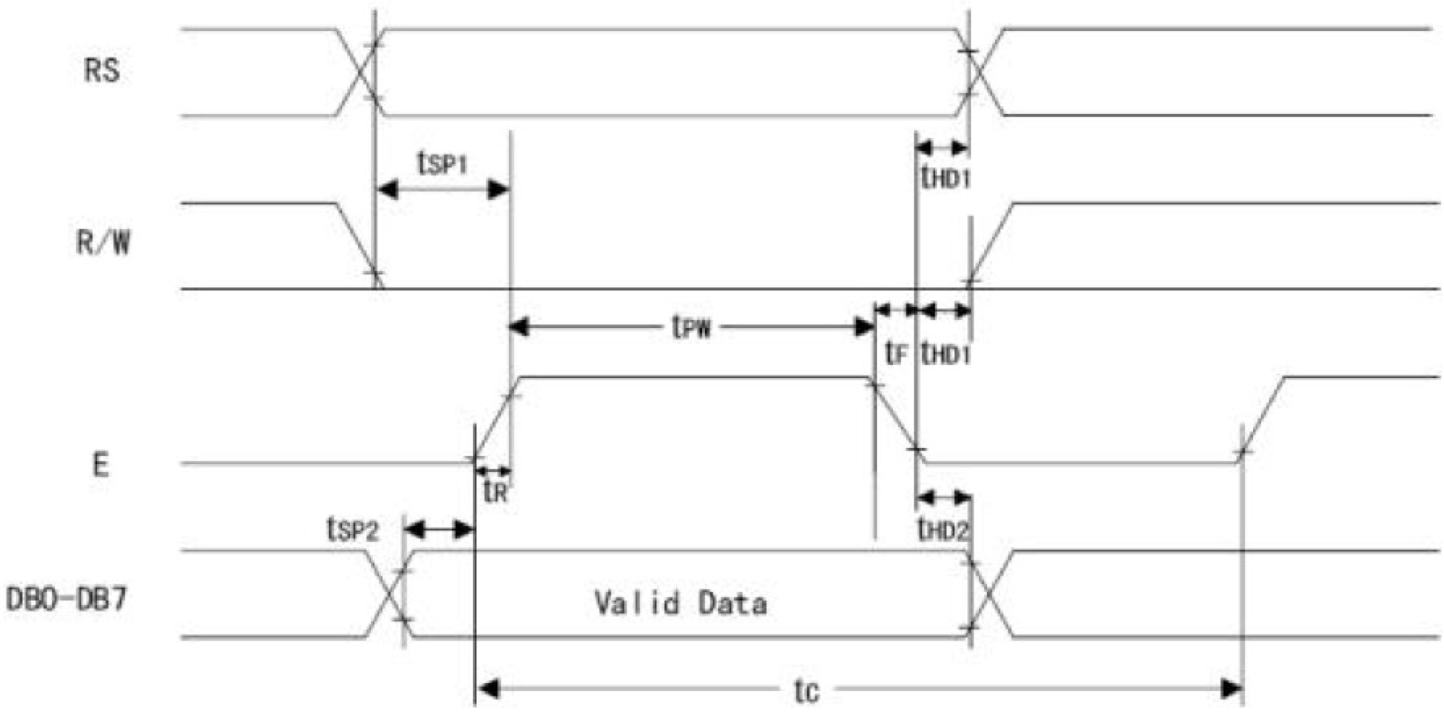
11 instructions: read data.

5. The basic operation sequence table

Graph: read operation sequence



Graph: write operation sequence



1602 LCD RAM address mapping and standard word stock list

Liquid crystal display module is a slow display device, so in the execution each instruction before must affirm module mark is busy low electricity

Flat, said were not busy, otherwise this instruction failure. To display character

before display character input address, also is tell module in

Where display character.

6. 1602 internal display address (pictured)

For example the second line the first character address is 40 H, so whether written 40 H can directly to the cursor positioning in the second line

The first character position? So no, because that address to request when the top bits D7 constant for high level 1 so

The actual writing data should be 01000000 B (40 H) + 10000000 B (80 H) = 11000000 B (COH).

In the LCD module in the initialization of first set its display mode, in LCD module display characters is automatic when the cursor move to the right,

Without human intervention. Every time before you judge input instructions LCD module are in favor of the state.

1602 LCD module of the internal character happen storage